Stories in Pictures

ROBERT W. WALKER
University of Illinois

Since 1953, FFA members in Minnesota have contributed over $200,000 to physically handicapped camps. The funds have been used to build a speech therapy building and greenhouses on the Camp Courage grounds. (Photo by W. J. Korteinikki, Minnesota FFA Executive Secretary)

Instructional programs in Forestry

Featuring — INSTRUCTIONAL PROGRAMS IN FORESTRY
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Forestry seems to appeal to today's action-oriented, identifiable youth. Vocational agricultural programs in this area should become an important part of vocational education in agriculture, especially in urban areas. Three important ingredients for success are present: employment opportunities, identifiable subject matter, and student interest. We must be sure that appropriate instructional programs are developed. We should listen to professional foresters. Success of vocational programs in forestry depends to a large degree upon acceptance by the forestry profession. Experience indicates students in our existing "forestry" programs do not possess a clear understanding of employment opportunities and educational requirements for entering the forestry profession or industry. Many professional foresters are asking us whether our programs of vocational education in forestry are suitable.

What might be a realistic framework within which instructional programs in forestry should be developed? Evidence seems to support the need for vocationally oriented high school programs, high school programs having a "pre-technical" orientation, and programs to meet the needs of the mentally and physically handicapped.

Employment opportunities exist in woodland utilization and forest products occupations. Most of these occupations require the type of preparation that can be provided in high school vocational programs. Harvesting and transporting occupations also fall into this category. While instruction and experience concerning the use of forest lands and resources should be provided, the instructional programs should focus on the occupations in which employment can realistically be expected. The outdoor training and harvesting instructional programs are attractive to students and teachers alike. But how much emphasis is being given to woodland utilization and forest products occupations?

Vocational education in forestry can serve another pur-
We need to inform students about employment opportunities available, requirements for education beyond high school and where appropriate post-high school education can be obtained. Instructional programs should provide pre-technical and subject matter plus practical experience in forestry needed to successfully enter post-high school programs. The practical experience component is especially important as many continuing education programs are interpretive and lack the opportunity for students to gain practical experience. But do we know what the forestry profession considers to be important subject matter and what experiences are appropriate? Forestry education provides a vehicle to reach many potential high school dropouts as well as students who are physically or mentally handicapped. We should help these students gain enough education to become employed and be productive citizens. We should identify these people and be sure we are not penalized should they not enter the forestry industry.

Realistic programs of vocational education in forestry should become an important part of agricultural education. We need to develop better lines of communication with the professional forestry world. It is necessary that "current vocational education should be expanded and generalized" to provide for "intellectual growth along both academic and vocational paths." They emphasize that "education for vocational competence should build in flexibility and adaptability to produce transferable knowledge and skills."

A third emerging concept has to do with the clientele of vocational education. The MIT Summer Study recommends that the new vocational education should be a part of the educational experience of all students. The 1960 report of the Advisory Council states that "some type of formal occupational preparation must be a part of every educational experience" which means appropriate occupational education for students in elementary schools, junior high schools, and senior high schools. The Secondary School Principals' Committee on Secondary Education says "a complete program of vocational education begins when the individual enters school. Teachers of agriculture, state and local supervisors, and teacher educators—as well as all in vocational education—must be prepared to make a strong point of view which hints, in a not so subtle fashion, of changes that are being made or may be forthcoming in vocational education. Our first responsibility is to apprise the adequacy and soundness of these generalizations; but it is equally important that we study, think about, and experiment with the new ideas and their impact on current and new programs of agricultural education. Will agricultural education be a significant element of the "new" vocational education?—JRW

Guest Editorial... pove. Many occupations in forestry require varying degrees of post-high school education. This may be of short duration such as a lumber grading school or longer term programs offered in two-year institutions or four-year colleges.
The forest technician job between the skilled forest worker and the professional forester. His education and training enable him to understand the needs for and the purposes of the task for which he is responsible.

The Society of American Foresters recommends that three-fourths of the technicians' training be practical with one-third to one-half of the training concentrated in field conditions. About one-half of the two-year forest technician program should be devoted to instruction in communication, business, and record procedures, technical math, and graphics and surveying. Special emphasis should be placed throughout the program on human relations as a basic ingredient in maintaining good working relations in an organization and with the public.

The professional forester differs from the aid and technician in that he has earned a college degree from a school offering professional training in forestry. His education includes basic work in the sciences, engineering, and humanities. As a minimum, the professional training must include forest economics, forest protection, resource management, dendrology, ecology, forest preservation, forest policy, and administration.

Recommendations

Whether the program is a high school vocational program, a post-high school technical program, or a professional education, or just part-time instruction, we strongly recommend that local forestry agencies and organizations be used to help develop and operate the program. Individuals who have an idea of what their future studies offer must make much better students and more satisfied employees. The use of work experience gives the student future assurance and a better understanding of the work ahead.

Although forestry aides can through their experience and training advance to the technician's level, most employers prefer the candidate to have completed a two-year program. When deciding to work for the highest goal, the apprentice will be paid more at all times.

Local consulting or craft committees in Vermont are usually composed of from five to seven members. It is recommended, at the local level, that each instructional area such as Farm Production and Management and Forestry have their own committee with efforts made to coordinate activities as needed.

- Coordination

For the past two years an all-day, state-wide meeting has been held with members of the State Committee, teachers of agriculture, and representatives of local consulting committees in attendance. The agenda included reports from both the state and local committees, workshop sessions, and a discussion of mutual problems including ways and means of coordinating activities and improving communications. Organization techniques applicable to local situations were formulated.

- Summary

State and local advisory committees composed of knowledgeable lay people can be of assistance to the agricultural education program. The all-day session described in this article and the two-way communications between the chairman of the state and the local committees help to coordinate the activities of the two groups in Vermont.
Instructional Program for Forest Rangers

WALTER R. KNUDSEN
Lake City Junior College and Forest Ranger School
Lake City, Florida

Lake City Junior College and Forest Ranger School, located 60 miles west of Jacksonville, Florida, offers three instructional programs in forestry. They are the Forest Ranger Program which will graduate its twenty-third class in August 1970, a Timber Harvesting Program which is in its third year of operation, and a two-year pre-forestry program which came into being seven years ago when the Junior College joined the Forest Ranger School.

Students

Students in the Forest Ranger School, which is one of the two oldest schools of its type in the United States, are selected from a large number of applicants, most of whom are from the southeastern United States. There are exceptions, however, as a number of foreign students have successfully completed the Forest Ranger Program.

Most applicants have one thing in common—the desire to work outdoors. There is one other factor which, unfortunately, many applicants have in common—a weak background in mathematics, particularly algebra. Too few high school counselors are aware of the mathematical requirements in forestry. The curriculum for a pre-forestry student includes algebra, trigonometry, analytical geometry, and calculus. These must be completed before the student transfers to a four-year institution to complete the requirements for his degree in forestry.

Courses

The program followed by students in the Forest Ranger Program includes the following courses:

- Forest mathematics: algebra, geometry, and trigonometry with an introduction to the concepts of probability, basic statistics, and distribution theory.
- General forestry: lecture and laboratory work on the basic principles and general practices of forestry.
- Forest protection: lecture and field study of fire behavior under controlled and uncontrolled conditions; field practice in prescribed burning and fire protection; damage and control of major insects and diseases of the nursery and forest.
- Forest drafting: laboratory instruction in use of drafting equipment to expedite forest mapping.
- Mammalogy: lecture and field study of forest life species in the United States including taxonomy, relative importance, and physical characteristics.
- Botany and soils: physiology and structure of higher plants with emphasis on plant-soil relationships.
- First aid and safety: study of standard safety practices, first aid procedures on-the-job and in-the-home including emergency procedures.
- Wildlife and recreation: an introduction to multiple use concept of producing wood and wildlife while maintaining the aesthetics necessary for recreation.
- Introduction to computerized forestry: general introduction to the history, basic concepts, features, and language of electronic computers with emphasis on forestry applications and uses; methods and techniques of gathering field data for computer analysis.
- Forest photoautogrammetry: application of the use of aerial photographs for forest management.
- Forest measurement: instruction in wood measurement, tree measurement, and timber cruising with field practice in scaling, measuring, and mapping.
- Artificial reforestation: study of life cycle of the principal southern pines with field work in nursery practice, direct seeding, and tree planting.

A student checks the age of a Slash Pine.

Fundamentals of human nature to develop understanding, tolerance, and better relationships; development of leadership qualities and high ethical standards with emphasis on discovering workable patterns for solving problems.

- Communicative skills: study of composition and rhetoric, with emphasis on clear, effective self-expression in writing expository essays, theses, and research papers.
- Fundamentals of speech: development and improvement of basic skills of speaking and listening through classroom exercises, oral reading, and public address.

Graduates

The program is very successful as each graduate has a choice of several jobs. Many students are interviewed and hired from courses taken prior to graduation. At the present time, there is a waiting list of employers. Most of the graduates are placed with the pulp and paper industry, but many go with the United States Forest Service, various state forest services, lumber companies, surveyors, consultants, United States Park Service, forestry and game departments, and the forest products industry.

The one-year Forest Ranger Program is the most rigorous on campus. The students attend class from seven to eight hours a day, five days a week. During the first semester, most of the time is spent in the classroom or indoor laboratory, but as the student progresses, more and more time is spent in the field. The summer terms are virtually all field work. Nearby Okeechobee National Forest serves as a 157,000-acre outdoor lab.

Timber Harvesting

The Timber Harvesting Technician program originated as a result of the need by wood-using industries for trained men to be employed as pulpwood producers, wood dealers, and logging foremen. The American Pulpwood Association leads its support and backing to the program by offering professional foresters as consultants, woodlands on which to work and teach, equipment to operate, and financial support. There is a great shortage of trained personnel in the logging industry in the South; and with a great demand for wood by ever expanding mills, employment possibilities are excellent for young men who are willing to work.

All of the forestry courses are taught by professional foresters with a wide range of experience. The forestry staff consists of five full time foresters and one consultant. The combined staff has a total of over one hundred years of experience in the field of forestry.

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March 1970
Forestry Instruction in the Vocational Agriculture Program

B. M. Dillard
Area Adult Teacher of Forestry
Folkston, Georgia

Forestry is a billion-dollar industry in Georgia, second only to the textile industry. Almost twenty-six million acres of the total thirty-seven million acres are in commercial forest land. Fifty-five thousand people are either directly employed by the forest industry or have equivalent full-time jobs in wood harvesting.

Some 6,919,238 cords of pulpwood were produced in Georgia in 1968. In addition, 1,022,280,000 board feet of saw timber was cut in Georgia in 1967. These facts substantiate the emphasis on forestry in the instructional program of vocational agriculture in Georgia.

The Need

Forestry in the instructional program dates back to the origin of vocational education in agriculture in the state. Sections of Georgia have never been "out of the woods," so forestry has traditionally been a crop for each county to serve to the total farming program. In areas where the livelihood of the inhabitants is largely dependent upon forestry occupations, strong local programs in forestry naturally evolved in vocational agriculture.

The Program

Only with tremendous support from industry and many dedicated individuals were we able to make the program functional. One problem facing the forest industry became acute because of a rapidly diminishing labor supply. This trend forced entrepreneurs into highly mechanized systems of wood harvesting requiring skilled equipment operators, cost conscious production minded managers, and safety oriented foremen who needed some background for this revolutionary change of operation.

The instructional program in forestry is designed to meet four needs indicated below:

1. Introduction to forestry covering basic units such as importance, tree identification, principles of plant growth, and elementary forest measurements. This introductory course, offered in the first two years of high school, is somewhat pre-vocational and orientation centered.

2. Vocational agriculture students at Central High School, Sumter, Georgia, learn to scale pulpwood in a specialized forestry course.

3. The modern vocational agricultural teacher works many "hats" in carrying out his professional duties. In any one day he teaches, counsels, advises, supervises, and listens to students. He develops the students, and as foreman, he encounters students with many individual differences at the junior and senior high school level, young and older adult education levels, and those who are disadvantaged. The role of the teacher is further complicated by the kinds of problems students have. These problems may be classified as sociological, academic, and vocational.

COUNSELING SITUATION

Teaching may be defined as guiding the learning process. This statement implies that guidance is closely related to teaching as well as to getting along with students. Guidance may be defined as helping students to learn about themselves and projecting this information toward making wise educational and vocational decisions. Counseling is based on the curriculum adapted to secondary school usage.

1. Here are some problem situations in which a vocational agriculture teacher may be involved in counseling students:

2. A junior student says, "Geo, Mr. Drake, I want to go on to college, but agriculture conflicts with chemistry this year. What should I do?"

A nineteen-year-old asks, "Why did you put me in this shop class of dumb kids? I can fix a gas engine faster and better than any one of those other guys?"

In making plans for next year, the farmer and new FFA officers want to involve girls enrolled in vocational agriculture in planning and carrying out the program of work.

During a young adult welding class, one student says, "What town needs is a good welding repair shop. Would you help me start my own business?"

How would you counsel the individuals in each situation?

COUNSELING PROCESS

I suggest that teachers go through a basic series of steps in order to counsel students effectively.

Preparation. Prior to counseling a student or group of students, the teacher must prepare himself. Some of these preliminary considerations include the situation, the cause of the problem or question, alternative solutions or answers, and possible courses of action to follow.

Introduction. This step is to acquaint the teacher and student come face to face to discuss a problem or question. The counseling situation may take the form of an appointed time for an interview or an unannounced, short discussion.

The latter may occur in the classroom, a place of business, on a farm, or elsewhere. Some problems will require office privacy, others will require parents, employers, or others to be present. Frequently the time of the counseling session is established at this time.

Stating the Problem. In some cases background information must be presented and the situation reviewed in order to state the real problem. In other cases, the problem may have been identified in the situation from which the counseling activity evolved. It is important that the counselor and student read through a simple statement of the problem.

Identify Problem Solutions. Hopefully, both the teacher and the student can contribute some possible hypotheses, solutions, or answers to the problem or question. For the purpose of eventual action, it is best if at least two or more alternative solutions can be identified.

Gathering Facts and Information. This step often begins with a question: Which of the solutions is best for this particular problem? Information can be secured from publications and pamphlets, audio-visual materials, visits, interviews with experienced individuals as well as from the involved individuals. Students who are actively engaged in seeking answers to their problems will be better prepared for the next step.

Making a Decision. The teacher may take a role in the leadership role in assisting students to use the information gathered and to weigh the alternatives thus presented. The step requires critical thinking and reasoning. In most cases, the student should be encouraged to make his own decision and live by it.

Follow-up. Follow-up of the counseling experience is essential for at least two reasons. First, the teacher needs to observe the results of the action or decision made by the student. If a decision failed, another one will need to be tried. In some situations, one step will have to go back to the beginning of the counseling process and re-identify the problem. Secondly, follow-up is necessary to evaluate the effect of counseling on the student. Was the student helped? Was the problem solved? Was the question answered?

This series of steps points out that counseling has at least two important characteristics. First, it should be a systematic process for most effective results. Second, it requires reflective and rational thinking on the part of the teacher and student. A third feature of counseling has to do with the leadership approach displayed by the teacher.

(Continued on page 225)

David O. Craig, Teacher Education University of Tennessee

THE AGRICULTURAL EDUCATION MAGAZINE

MARCH, 1970

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Forestry Instruction for Post-Secondary Students

EYREIT D. DAVIS, Associate Director
Missoula Technical Center
Missoula, Montana

The forestry program at the Missoula Technical Center in western Montana is a unique post-secondary program in which students are exposed to the profession of forestry while learning the skills required for technical positions in the forest industry.

The program is well understood in the importance of forestry to the economy of western Montana. The city of Missoula is the hub of a vast natural resource based economy including federal and state regulatory agencies and research and educational branches of forestry as well as private industries using forest products.

Strengths

The strength and growth of the program are due to several factors.

The forestry program has the strong backing of local forestry organizations.

A close working relationship is maintained between the Missoula office of the U.S. Forest Service, the State Foresters' Office, the School of Forestry at the University of Montana, and private logging operations.

Two programs of the Missoula Employment Security Commission Office and the Vocational Education Programs in the United States Office of Education, Veterans Administration, Bureau of Indian Affairs, Division of Vocational Rehabilitation and various other agencies are supported.

Curriculum

The curriculum is approved by the Montana Department of Public Instruction and the Missoula State Board of Vocational Education. Programs are further approved or accredited by the United States Office of Education, Veterans Administration, Bureau of Indian Affairs, Division of Vocational Rehabilitation and various other agencies.

Cooperation received from the U.S. Forest Service and the University of Montana School of Forestry permits utilization of work experience and experimental forests by the instructional staff in this important phase of the training. Experience is thus received through both theoretical and practical approaches to "on-the-ground" problems.

Two unique experiences provided the students during the fall quarter highlighted the practical phase of the curriculum. Students were introduced to an intensive practice of thinning forest stands with fire. A specially arranged lecture followed by field application enabled students to acquire first-hand knowledge of this technique. In addition, the students were introduced to cut and cable logging techniques especially applicable in logging large volumes per acre of virgin timber.

Students

The typical forestry student at Missoula Technical Center is single and between 18 and 26 years old. He has had high school education and a few students have some post-secondary educational experience. Only one of the thirty-five students is from out of the state. This is due to the large number of applicants from within the state and the shortage of space available for training larger numbers. Thirteen of the fifty-five students receive some financial assistance from one of several agencies (Bureau of Indian Affairs, Veterans Administration, Vocational Rehabilitation) or are on a work-study program.

The students are interested in living and working out-of-doors, are fairly adept at work without an average or below average in the communication skills, and have an inherent desire to work with the training given at the entry level with expectation of eventual advancement toward the wood harvesting phase of the forest industry.

High School Program

Two area technical schools offer a post-high school course in wood harvesting technology. Some high school graduates choose to further their training at these centers.

Adult instruction is an important phase of the vocational education program. The responsibilities of identifying the problems areas in forestry relate with local teachers. Coordination of activities in their school and rely in the area for help in preparing the material applicable to the problem.

There are 118 vocational agriculture schools in Montana which serve as a laboratory for the general vocational education program. The Missoula Technical Center forestry program is designed to prepare field technicians to take their place in the world of forestry.
The Changing Nature of Forestry Education

HARRY L. MOSHER
The Pennsylvania State University

Educational institutions at all levels are beginning to take a closer look at programs for students interested in careers in forestry and related fields. Many high schools are studying the possibility of implementing programs in forestry or in the general area of agricultural resources. These relatively new instructional areas at the high school level are the result of new demands.

As the work-week is shortened and leisure time consequently lengthened, mankind naturally turns to the outdoors for recreation and revitalization. Marion Claffin, in his 1960 book Resources for the Future, made predictions about the demand for recreation in the year 2000 which were laughed at as being unrealistic, but today his estimates have been far exceeded.

As an example of new demand, the American public has enjoyed a 51 percent increase in outdoor recreation experiences alone during the last five years. These new demands have stimulated an increased need for more specialists in the fields such as recreational planning and development. Since much of the recreation is to be done in a forested environment, new restrictions are therefore being placed on the traditional use of forests for timber, water, wildlife, and recreation. These demands, restrictions, and the consequent changes in objectives for the management of our resources require more efficient and productive use of personnel.

New High School Programs

Leaders in agricultural education are seeing these demands for new personnel and translating them into viable programs in many schools. The Pennsylvania State University through its School of Forest Resources and its Department of Agricultural Education is rapidly developing new programs aimed at the entire range of employment. The Department of Agricultural Education has recently developed a high school curriculum in agricultural resources which includes an array of courses such as conservation of agricultural lands and other natural areas, fish and wildlife, soil, water, air, and the development and management of recreational areas. A high school program of this nature is uniquely designed to stimulate student interest in those subjects to the point where they will be encouraged to enter post-high school training programs. Only through high school programs of this nature can qualified individuals be attracted to newly developing fields of specialization.

Also being developed is a high school program in forestry. Students completing the program will be prepared for employment in entry positions of harvesting and protection. More importantly, they will have been exposed to the work environment of this out-of-doors occupation and nowhere else have the sound basis and preliminary background for entry into post-high school programs.

The advantage of a high school forestry program cannot be stressed enough. Under the present system in many professional forestry schools, course offerings have been upgraded and forestry subjects are restricted to the final two years of college. Even when students complete forestry courses, they often fail to explain to potential employers on the broad theoretical concepts and the development of managerial skills. High school programs in forestry thus offer unique opportunities for students to test their interest in the occupation in general. Specifically, high school forestry programs help students decide whether to take the technical track or the professional track in post-high school programs.

Programs for Technicians

A second area of interest is the increasing demand for technicians. The following definition developed by the Society of American Foresters’ Committee on Training of Forest Technicians in 1965 describes what people in the forestry occupation mean when they describe an employee as a technician.

The forest technician is a person competent to occupy a responsible position in the line of activity between the non-professional forester and the professional forester. He performs the activities of the forester under the supervision of the latter, and usually in a specialized field. In addition, he may be called upon to recruit, train, and develop additional forest personnel, to conduct studies and field surveys, to prepare maps and reports, and to perform other duties as assigned.

Forestry Technician Program

Following a study of the demand for forestry technicians, the Pennsylvania State University implemented a two-year Associate degree program in September 1963 as its Mount Alto campus where forestry had been taught since 1933. This program is guided by three major objectives for post-high-school technical education.

To present courses designed to meet the specific needs of the technician. These courses will not be designed primarily as transfer courses but will be planned so as to present the maximum amount of usable information on activities, methods, and techniques. Background material and theory is to be kept to a minimum and presented only in such quantities as is necessary if the student is to grasp the technical subject matter.

To develop within the limited time of the programs as high a degree of field skill as is possible. This is to be done by recognizing that since forest technician training requires a somewhat different training schedule from that of other academic subjects, certain forestry courses should not be required to conform to the general academic schedule and therefore should be scheduled to provide extended field time to accomplish the specific objectives of the program.

To supplement the technical phases of the program with general education courses geared to provide basic academic skills as well as to develop skills in communications and human relations necessary for the graduate’s further advancement into supervisory positions.

Further effort is being made to implement additional technician level programs in wildlife and recreation. Each of these programs is designed to meet the specific new demands of the industry.

Additional signs of the changing nature of education in forestry is evidenced by the new name for the four-year professional program in forestry called “Forest Science” which more properly signifies the emphasis on the scientific and managerial aspect of professional forestry education at the college level. A review of this professional program shows many changes from the traditional one. Biometrics has replaced stenography and mathematics, statistics and computer science now receive increased attention, and traditional courses such as silviculture, entomology, pathology, and dendrology are refocusing their goals toward more in-depth scientific study.

Progress

It is clear that agricultural education, benefited by increased federal funds, is making rapid strides to meet the continued demands of off-farm education. In addition it is constantly alert to provide the full range of educational opportunities for off-farm occupations as well. As new demands emerge, it believes all educators to continue to improve communication with each other in order to develop high quality, well-coordinated programs throughout the entire spectrum of agricultural education.
Agricultural Education in Kenya

ROBERT H. MAXWELL, Teacher Education
West Virginia University

Every society has a way of transforming knowledge to the younger generation, particularly so in occupations that are of major importance. Kenya has a long tradition of agricultural education in this sense. Many of the traditional practices of agriculture, as practiced and tested and prove in a setting which they were developed, particularly freedom in their application. As technological problems provided new alternative and sources of credit became available to solve some of these problems, new opportunities and a new awareness of the possibilities have given impetus to a more intensive and interesting program of agricultural education within the country.

• The Setting

Independence was celebrated in Kenya on December 12, 1963. It was on that day—and it remains—a land of diverse peoples, problems, and potential. Sitting astride the equator on the eastern coast of Africa, Kenya shares many of the problems of her neighbors. The population growth rate is high; agricultural production is erratic; soil erosion is increasing; famine and inflation is present. Charges of tribalism from the Kikuyu and the Masai from the political opposition. Africanization of commerce and industry is occurring more slowly than might be expected. If the people would like to see, and there probably are flaws in the government's programs of education at all levels. Often industrialized is proposed as the panacea for countries like Kenya where many people are available to the population derive their livelihood directly from agriculture. However, the Kenyan government has justifiably set its course toward increasing agricultural production and rural employment as a prerequisite for pronounced industrial development. Nevertheless, a

Agricultural Education in Kenya

Robert H. Maxwell, former vocational agriculture teacher in Iowa, serves from 1960 to 1963 as an instructor in Kenya for the pilot project described in the article. In 1964, Mr. Maxwell returned to Kenya as West Virginia University's Chief of Party and served until 1968 as the Agricultural Education Officer in the Kenya Ministry of Education and at the University's field administrator on the project. He is currently on leave from West Virginia University studying for a doctorate at Cornell University.

Robert H. Maxwell

THE AGRICULTURAL EDUCATION MAGAZINE

MARCH, 1970

...the rural-urban migration is taking place, particularly among the young people.

• Agriculture in Kenya

Diversity characterizes the agricultural sector. There are small holdings where all production is a result of hard labor. On the other hand can be found large scale, rather highly mechanized and fairly efficient farms of 1,000 acres or more. There are coastal farms of sugar and coastal areas of coconut and sugar groves contrasted with high altitude farms specializing in pyrethrum, small grains, or grass, dairy, and sheep production.

Some areas are well-watered but nearly three-fourths of the country is desert or near desert—much of it being used as communal grazing by the nomadic herds. There are unimproved indigenous cattle and sheep that leave a great deal to be desired when compared with dairy or beef breeds built upon imported breeding stock or local stock as the Boran whose breeders have now formed their own local breed association.

Many of the rural population are described as subsistence farmers and the subsistence is a relative thing. There are years when subsistence farmers feed their families quite well, and the nomadic tribes have more milk than they can drink. Then there are years when food is in short supply and people (and cows) stay starvation and death.

In the decades since World War I more and more emphasis has been placed on production of agricultural cash crops for export. Coffee, tea, sisal, and pyrethrum lead the list of foreign exchange earners for Kenya. Small grains are grown in many parts of the country, livestock production is increasing, and maize (corn) remains the staple food crop of the common people. A great variety of tropical fruits are produced and all the common vegetables are or can be grown.

In this setting, increasing agricultural production is of paramount importance. To help facilitate the development of an increasing population and for the stabilization and growth of the economy. Rather substantial amounts of capital from both the public and private sector are being invested in agriculture and the long term returns hinge primarily on one major factor—trained manpower.

• The Secondary Program

In an effort to build a base of manpower with agricultural interests and abilities, a pilot project was initiated in 1960 to test the feasibility of teaching agriculture in secondary schools in Kenya. A unique setting for this experiment was chosen in Western Prov-

A Kenya student gets experience in driving a tractor.

The agricultural extension service in the country is an important source of information for the farmer. In the past, the service was mainly oriented towards the large-scale farmers. However, with the growth of small-scale farming, there has been a shift towards better training programs for these farmers. The agricultural education program in Kenya has been designed to provide practical and theoretical knowledge to farmers at all levels. The program aims to help farmers increase their productivity and improve their living standards. The agricultural education program in Kenya has been successful in improving the quality of agricultural education and training in the country. The program has been praised for its practical approach and its focus on the needs of the farmers. The agricultural education program in Kenya has been an important contributor to the economic development of the country. The program has helped to increase the productivity of the agricultural sector, which is a major contributor to the country's economy.
FORESTRY INSTRUCTION FOR HIGH SCHOOL STUDENTS

NOLAN ALBERS, Teacher of Agriculture
Neogordo, Texas

It has been said that the future belongs to those who prepare for it! We in vocational agriculture have prided ourselves in offering the best in opportunities for life preparation.

The Program

With such overwhelming evidence of the need for forestry instruction, we developed a course in forestry production, processing, and services. The pre-employment laboratory training program is open to a limited number of juniors and seniors who enroll in four other courses and forestry. Two credits are given upon successful completion of the course. Students receive two hours of instruction daily.

The purpose of the course is to acquaint students with subject matter on the management of trees grown as a crop. Harvesting, processing, marketing, and services also receive attention. The specific objectives are to assist interested students in developing an understanding of practice opportunities in forestry, to assist students in developing skills and abilities in forestry through planned on-the-ground work experiences, and to assist students in developing a sense of safety in forestry operations.

The curriculum includes the following major units of instruction: introduction to forestry as an occupation; forestry in Texas; growth, reproduction, and identification of forest trees; forest protection; measurement; harvesting; reforestation; marketing; pulpwood production, purchasing stumpage, marketing forest products, equipment for pulpwood production, labor, and management, insurance and accounting, financing a pulpwood producer, and safety. Each unit is covered thoroughly with on-the-ground training.

Laboratory Experience

We are using a thirteen-acre forest farm near the school that vocational agriculture students have been managing since 1952. The help received from forest industries is essential. Industry here in the area is cooperative that the students feel a part of each industry. Our lab, the woods, are where the products are manufactured in the mills, since field trips are taken to woods using plans in driving distance from the school. Already, some students have job offers for summer employment in forest industries.

Each student will work during the summer in the industry. After this on-the-job training, students enter a cooperative program in which they attend school one-half of each day. After this program, the students train in one of the forestry training stations. Four to five hours will be spent there during the summer, and the students will become proficient in the area of their specialization. The student will receive an average of about $1.50 per hour for his training, plus two school credits.

Students in the Pre-employment Laboratory Program in Neogordo are becoming well trained in providing foremanship to industry.

Dale C. Aabischer, Supervision
Wisconsin Department of Public Instruction

Changes in Supervision Require Work with Local Vocational Education Coordinators

—A constantly expanding technology which challenges even the most able person.
—The constant and changing array of social, economic, and political problems which a highly efficient system of communications keeps before citizens who have difficulty in analyzing and relating to the complex world in which they live.

Demonstrated Values

Agricultural education supervision cannot be expected to solve all the problems noted. There is much, however, in the program of vocational agriculture which is already demonstrated in enabling students to make satisfactory adjustments to the demands of present society, to meet which are the activities which enable students of all abilities to achieve within their limitations, to establish a personalized value in relation to problems of making a living and in living in harmony with others, and to develop leadership. The recognition and improvement of such basic values in vocational agriculture as emphasis, individual instruction, the project method of teaching, the relating of a student's out-of-school experience to instructional programs, the involvement of parents in the instructional process, and the emphasis on leadership training are all important.

With the constant expanding demands upon supervisory staffs as enrollment grows and the complexity of school supervision increases, state staffs are finding increasing difficulty in providing the help and counseling for local agricultural education supervisors which has been traditional. At the same time, the need for such help is greater than ever before.

Local Coordinators

The development of local vocational education coordinators is one means of meeting this problem. Such a person is part of the local administrative staff with the specific responsibility of developing and supervising the local vocational education program.

Among the competencies and qualifications which a local coordinator should possess are a successful background in vocational teaching, including the philosophy of vocational education, the capability of analyzing local needs and providing leadership in developing a total vocational program to meet such needs, a capacity to interpret and relate effectively the local vocational program to the school administration, teachers, students, and the public. He will need to understand and encourage the development of all segments of the vocational program with impartiality.

In such a capacity, the local vocational coordinator can draw on state supervisors for suggestions and help in planning local agricultural education programs, interservice teacher education, development of program standards, improvements of instructional methods and techniques, and in evaluation procedures. He is in a most favorable situation through day-to-day contact to provide essential help to a beginning teacher and others who need reorientation.

In addition, the local coordinator may assume responsibility for compiling the numerous reports associated with program development, relieve the teachers of this burden. He becomes a medium to bridge the constantly widening gap between the state agricultural education supervisors and teachers. Much of what has been accomplished in vocational agriculture in the past through face-to-face contact between supervisors and teachers may need to be accomplished through local vocational education coordinators.
Instruction in Forest Technology

JOSPH G. SICK

Williamport Area Community College
Williamport, Pennsylvania

List of Courses — Forest Technology

First Semester

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<tr>
<th>Course Code</th>
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<tr>
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<td>English and Composition</td>
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<td>Intermediate Science</td>
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<td>Forest Surveying I</td>
<td>Equipment and Machinery</td>
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<td>Timber Harvesting</td>
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<td>Forest Protection</td>
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Fourth Semester

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<td>Forest Recreation Improvements</td>
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<td>Forestry Economics</td>
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The Wood Products Program

The Wood Products Department was formed in January 1969. Early activities centered around the designing and fabrication of an instruction unit and work procedures. The project was spearheaded by a cooperative effort of the Forestry Department and the Wood Products program.

The Wood Products program is designed to provide students with an understanding of the principles of forestry and the management of forest resources. The program is designed to prepare students for careers in forest resource management, forest conservation, and related fields.

Forestry Education

Forestry Education consists of courses in the natural and social sciences, as well as professional education. The program is designed to provide students with a comprehensive understanding of the principles of forestry and the management of forest resources.

The Wood Products Department offers courses in three areas: tree anatomy, forest biology, and forest ecology.

The Wood Products program is designed to provide students with an understanding of the principles of forestry and the management of forest resources. The program is designed to prepare students for careers in forest resource management, forest conservation, and related fields.

Students interested in entering the Wood Products program should contact the instructor for more information.

The Wood Products program offers a variety of courses that provide students with a comprehensive understanding of the principles of forestry and the management of forest resources.

Advisory Committee

The Advisory Committee consists of representatives from the forestry industry and related fields. The committee meets regularly to discuss the needs of the program and to provide guidance to the students.

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Forestry Instruction in a Natural Resource Technology Program

CHARLES WIDMARK and ELWOOD WESSMAN
Brainerd Area Vocational Technical School
Brainerd, Minnesota

The Brainerd Area Vocational Technical School (Brainerd, Minnesota) initiated a two-year post-secondary subprofessional course in Natural Resource Technology in the fall of 1968. The need for such training has long been recognized by natural resource management personnel. There is a need for trained personnel with a well-rounded background in the natural resource field to assist professionals in adequately carrying out the desired programs.

Course of Study

An advisory committee consisting of representatives of federal, state, and regional conservation agencies and individuals from private industry gave direction to the formulation of the course of study for the program. Much emphasis is placed on "learning by doing" in the school's outdoor laboratory. The school has at its disposal a tract of land consisting of several thousand acres bordering the Mississippi River just adjacent to the town of Brainerd. This area provides opportunity for instruction in forestry, soils, water, and wildlife management. A high percentage of the students' time is used in field activities.

Students attend classes six hours a day, five days a week for a two-month term. Each student is placed in a supervised work experience position for a period of ten weeks during the summer between the first and second year of training.

Students

The number of students entering the program far exceeds the number of job opportunities available and therefore limitations on student enrollment are adhered to. Many of the young men entering the program seem to be generally dissatisfied with the previous generation's approach to natural resource management and have a true interest in the preservation and conservation of these resources. There appears to be little emphasis on the materialistic values of our economy but rather a desire for a real interest toward the aesthetic and moral values of our society as it pertains to the management of natural resources.

Graduates are qualified as conservation aides and seek employment with federal, state, and private industry in the areas of natural resource management. In Minnesota's Department of Conservation, the graduates will seek employment as Conservation Aides II and will be qualified to advance to the Manager I and Manager II levels. Positions as conservation aides offer opportunities in four different options — forestry aides, park aides, fisheries aides, and wildlife aides.

Courses

Supplemental courses essential to a sound foundation in forestry include botany, ecology and wildlife, surveying, mathematics, conservation, soils, mechanical skills, field observation and note writing, and verbal communication. The forestry sequences are developed in five major areas of study: inventory; cultural practices; harvest; protection; and management.

Forest inventory (crating) is the measurements of merchantable timber, reproduction and stand growth. It is the process of determining the materials on the "merchant's shelf" that yields, shortcuts, and strong points of the timber resource can be recognized for planning and development purposes. Some of the skills learned are pacing, chaining, compassing, compassing design and statistics, legal land descriptions, map making, meters and boards layout, area calculations, aerial photograph measurement of standing timber, point sample cutting, gathering and compilation of data, and the drawing and interpretation of cutway.

Cultural practices (silviculture) is the cultural treatment of timber stands for the betterment of the forest. Such practices as the thinning of timber stand density through thinnings, marking timber for harvest cutts to encourage reproduction, precommercial thinnings, brush control and weed species eradication, and seeding and planting are undertaken in the field.

Harvest (timber harvest and product measurements) involves the cutting and operating of timber and the measurements of their volume and value. Such skills and understanding of cutting, bucking, skidding, development of roads, landing locations, influence of brush distances, scaling, costs, and types of equipment used are stressed here.

Protection encompasses primarily the study of potential agents of destruction of the forest and how they can be prevented or their damage minimized. Fire prevention, fire suppression and suppression, slash disposal techniques, insect and disease recognition and control as well as control of damage from the elements are studied.

Management is the final phase of study in forestry where all the information and skills are used in managing timber lands. The skills, techniques and study in management include determination of volumes to be cut, sustained yield, allocation of cutting areas, species adaptability to types of management, cutting cycles, timber sales development, long term investment, compound interest and the forest enterprise, and multiple use management.

Conclusions and Comments

"It is our purpose to provide graduates who can be the liaison between the professional manager and the field crews in implementation of management programs.

Theoretical background necessary to "get the feel" of all areas of work is vital to proper field performance.

Practical application of all skills taught are required of each student so that he has not only read about, heard of, or seen the skill accomplished but has actually undertaken the skill.

The size of the class is held to the number of job openings available, approximately twenty. A ratio of one student to five candidates actually interviewed has been our experience.

The teaching of conservation philosophy is a definite part of our program, but development of employable individuals found in techniques and job performance is our basic objective.

Institution in Forest Technology (Continued from page 232)

crop, surveying, dendrology, forest recreation, wildlife management, and silviculture.

Graduates

The success of any program can be recognized in the number of positions filled by graduates in their major fields. A survey of our graduates in 1969 has revealed that all but three of the forestry students are employed in key positions in lumber industries, the Department of Forest and Waters, and the Pennsylvania Game Commission.

This speaks well for the program. We gave our instruction constantly to the ever-changing needs and demands of the forest industry.
Pre-Employment Laboratory Instruction
in Forest Products Harvesting

EDWIN E. SMITH
Teacher of Forestry
Cleveland High School
Cleveland, Texas

There are approximately 150,000 woodland owners in East Texas owning more than 11,200,000 acres of commercial timberland. Eighty percent of these owners hold less than one hundred acres each. The survey value of timber from Texas' primary timber manufacturing plants is over 200 million dollars. Secondary manufacturing adds another 114 million dollars.

It has been stated that each $1.00 from standing trees adds $25.00 to the Texas economy through harvesting, manufacturing, construction, transportation, and marketing. This is why a Forestry Products Harvesting course has been added in some high schools in East Texas.

Pre-Employment Training

The program is designated Pre-Employment Laboratory Training in Vocational Agriculture which is designed to provide technical instruction and practical experience for high school students preparing to enter employment in occupations requiring knowledge and skills in one or more of the many jobs in forestry.

Cowen spends two hours each school day in the classroom and laboratory and earn a minimum of one and one half elective credits per semester. The program also provides the advantages of belonging to the FFA.

In March 1968, representatives of the forestry industry met with Texas' Director of Agricultural Education about offering a laboratory course in forest products harvesting for high school juniors and seniors. Several schools were contacted to see if they were interested in initiating the program.

Our superbirdcave was merited in the training program, and we felt that there was a need for this in our school. The program was set up in the fall of 1968 with six boys enrolled. Since then eight have been enrolled in 1969-70.

Course Outline

A course outline has been developed around the objectives of assisting students in developing skills and abilities in forestry through planned and supervised work experiencing, developing an understanding of nature and environment in forestry, learning the basic functions of the forest industry, and the basic use of forest industry tools.

Students have worked on such things as uniform standards for employment in the wood division of paper mills and related industries. Employment for high school graduates is of this type of training includes sales and service salesmen, machinists, machine operators, timber cutters, and wood procurement agents, pulpwood producers, timber cruisers, pole inspectors, timber cutters, small equipment repairmen, timber classifiers, and research and development specialists.

During the year students learn on forestry as a career, visit the county courthouse to study deeds and titles, and take field trips to small sawmills, fire control demonstration, pulpwood mills, fire towers, brown hand mill, nursery, paper mill, forestry field days, and work with starting crews and crews gathering pine cones. Some of the units covered are employment opportunities in forestry, identification and how trees grow, protection from fires, insects and disease, multiple use of forest, special forest service labor laws concerning logging and contracts, and the changing image of the logging industry. Also included are units on management of timber, forest industry, purchasing stumpage, marketing pulpwood, equipment and labor for pulpwood production, crating timber, felling, and harvesting pulpwood.

Contributions to Industry

Harvesting forest products calls for highly trained individuals who possess abilities in business management, personal development, and the like. The students have shown much interest in the program and the good working relationship with representatives of the industry who have helped in planning and developing the program have proven to be most beneficial. The program is also designed to provide an opportunity for those persons already employed in technical forestry occupations to obtain further training.

An advisory committee of industry personnel and other people have helped make the program a success in our community. I feel that in the time we will help the labor problems in the timber industry.

An advisory committee of industry personnel and other people have helped make the program a success in our community. I feel that this program not only has helped and is helping the forestry people in the community, but has strengthened our total vocational agriculture program in the community and school system.

Central Oregon Community College is located in the approximate geographic center of the State, an area surrounded by intermingled stands of ponderosa pine and western juniper. To the west and north are large holdings of National Forest land. These lands, managed by the United States Forest Service, are used extensively as field laboratories. The nearby Cascade Mountains provide unique opportunities for studying heavy recreational use as it relates to the management of both commercial forest and wilderness areas.

Program

The courses offered in Forest Technology are designed to give students an opportunity for positions as they relate to the various uses of forested lands. Expanding markets for wood products and dwindling supplies of timber have led to the necessity of intensively managing second growth timber. This has created an increasing demand for technically trained men to meet this challenge.

The program is also designed to provide an opportunity for those persons already employed in technical forestry occupations to obtain further training.

The curriculum was designed with the advice and assistance of a special advisory committee of representatives of the research, management, and marketing branches of the industry. This committee meets periodically to review the progress of the program and suggest revisions which may be needed to meet new occupational and industrial requirements as they develop.

Three full-time forestry instructors are assigned to the program. In addition, part-time instructors from management and industry are hired to teach specific courses. General education courses with special emphasis on mathematics and English composition are taught by the regular college staff.

All courses of a technical forestry nature are designed so that the learning process will include a maximum amount of actual field experience. This field experience is obtained through weekly field trips and field laboratory exercises for each course.

Supervised on-job training is not included in the program, but all students are encouraged to work as forestry technicians during the summer between their freshman and sophomore years.

The Forestry Technology program requires satisfactory completion of 94 quarter hours of training during the two-year period. Technical training includes several courses in each of the following fields of study: tree and range plant identification, surveying and mapping, leg scaling and timber cruising, range and wildlife management, forest regeneration and timber harvesting; prevention and control of forest fires and insect infestations; recreation and watershed practices; and crew management and safety. General education courses include mathematics, English, speech, technical report writing, and applied psychology.

When compared to forestry technology programs at other schools in Oregon and Washington, the program at Central Oregon Community College is somewhat different. Watershed and range management training is emphasized because the College serves an area which includes large acreages of grassland, as well as timberland, on both the east and west sides of the Cascade Mountains.

Students

Upon successful completion of the two-year program, students receive an Associate of Science degree in Forestry Technology. They are prepared for highly-skilled, technical, and semi-professional jobs.

Approximately two-thirds of the students have received an Associate of Science degree in Forestry Technology. They are prepared for highly-skilled, technical, and semi-professional jobs.

Women are also encouraged to participate in the program. One or more women have been enrolled as full-time forestry technology students almost every term of the school year since the program began.

Graduates have found their employment quite satisfactory. Most have found a type of work to which they have been able to adapt the training received. Promotions to responsible positions have been rapid. Graduates are primarily employed as timber cruisers, log graders, timber sale administration, range management technicians, timber cruisers, surveying crew foremen, supervisors, and recreation specialists.

THE AGRICULTURAL EDUCATION MAGAZINE

MARCH, 1970

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UNDERSTANDING AND MEASURING HORSEPOWER
MOTORS: ENGINES, TRACTORS, Athens, Georgia: American Association for Agricultural Engineering and Vocational Agriculture, 1969, 72 pp. $3.00.

The terms energy, force, work, torque, and power are discussed with relationships among the five. The horsepower formula is developed. Manufacturer's terms such as the maximum, net, continuous, and rated brake horsepower are explained. The torque and horsepower comparisons will enable you to understand the design terms used today.

Part two of the book develops the techniques for determining the power requirements of electric motors, gasoline engines, or tractors in terms of size and type of load. Illustration of the Nebraska Tractor Test is also covered.

Dynamometers are used to measure force or power. The pre-bake, water-brake, hydraulic gear pump, electric and string and spring units are illustrated. The discussion of the merits and limitations will be helpful when a dynamometer is selected for the instructional program. Testing facilities are described, tools are listed, and the power safety equipment is recommended. Regards to the dynamometer selected the proper operation procedure for testing of the power unit is outlined step by step.

The absence of the horsepower formula is worthless without accurate interpretation of the data and assistance is found in part four. The appendix is worth the price of the book as horsepower is determined mathematically. The derivations of the horsepower formula is explained and the elements which influence horsepower are discussed.

Book Reviews
Gerald R. Fuller, Special Editor
University of Vermont

ROCHESTER BOOK REVIEW

BOOK REVIEW

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Stories in Pictures

ROBERT W. WALKER
University of Illinois

The annual meetings of the American Association of Teacher Educators in Agriculture were held during the AYA Convention in Baton Rouge, December 1969. Charles C. Drewbaugh (right) of Rutgers University, AATEA President for 1970, performs under the watchful eye of Paul Revere. (Photo by Robert W. Walker)

W. Howard Martin, Professor of Education at the University of Connecticut, presents the AATEA Lecture on "Agricultural Education: Image and Substance." (Photo by Robert W. Walker)

George F. Ertman (right), Emeritus Professor of Agricultural Education at the University of Missouri, is presented the 1969 AATEA Distinguished Service Award by George L. O'Keller, Jr. Vice President for the Southern Region. (Photo by Robert W. Walker)

AATEA EXECUTIVE COMMITTEE: (Left to right) George L. O'Keller, Jr., University of Georgia, Southern Region Vice President; Richard H. Wilson, The Ohio State University, Central Region Vice President; W. H. Huestis, University of New Hampshire, Secretary; Charles C. Drewbaugh, Rutgers University, 1970 President; Orville E. Thompson, University of California at Davis, 1969 President; William S. Drake, Cornell University, Atlantic Region Vice President; George L. O'Keller, Jr., University of Kentucky, Treasurer; Irving C. Cross, Colorado State University, Pacific Region Vice President; Alfred H. Krebs, Virginia Polytechnic Institute, Past President; and Gerald S. Parker, University of Vermont, Atlantic Region Alternate Vice President. (Photo by Robert W. Walker)